

# UNAVCO

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August 16, 2001

Dr. John LaBrecque  
NASA Headquarters  
Solid Earth Science  
300 E Street, SW, Code YSG  
Washington DC 20546-0001

Dear Dr. LaBrecque:

I am please to submit for your records the following final report for grant NAG5-8627 entitled Joint UNAVCO and JPL proposal to NASA for support of the Solid Earth and Natural Hazards (SENH) Research and Applications Program and Internation./

This report consists of the following sections:

- (1) New Installations (with site visits)
- (2) Upgrades (with site visits)
- (3) Upcoming upgrades (with site visits)
- (4) Data management and archive efforts during the performance period.

## **1. New Installations (with site visits).**

During the performance period July 1, 1999 – May 31, 2000, the UNAVCO Boulder Facility performed the following new GPS station installations in support of NAG5-8627:

- a. CORD Cordoba, Argentina. Installed new IGS/GGN station with TurboRogue receiver in collaboration with CONAE.
- b. YKRO Yamoussoukro, Ivory Coast. Installed new IGS/GGN station with TurboRogue receiver in collaboration with Bureau National D'Etudes Techniques (BNETD).
- c. CRAO Simeiz, Ukraine. New SENH station with TurboRogue receiver in collaboration with Crimean Astrophysical Observatory.
- d. IRZU Irazu Volcano, Costa Rica. New SENH station with TurboRogue receiver in collaboration with OVSICORI.
- e. RABT Rabat, Morocco. New SENH station with TurboRogue receiver in collaboration with EMI and MIT (replaces old installation at IAVH).
- f. TETN Tetouan, Morocco. New SENH station with TurboRogue receiver in collaboration with Abdelmalek Essaadi University and MIT.
- g. Taal Volcano L1 Installations, Taal Volcano, Philippines. Installation of a 12-station L1 network to monitor Taal Volcano.

- h. Popocatepetl Volcano L1 Installations, Popocatepetl Volcano, Mexico. Installation of a 4-station L1 network to monitor Popocatepetl Volcano.
- i. Hawaii L1 Installations, Mauna Loa and Kilauea Volcanoes, Hawaii. Installation of a 12-station L1 network to monitor Mauna Loa and Kilauea Volcanoes.
- j. DiVE Differential Vertical Motion Estimation Project, San Diego, CA. Installation of one L1 station co-located with a dual-frequency receiver and an existing tide gauge. Collaboration with Central Washington University.

## **2. Upgrades (with site visits).**

During the performance period July 1, 1999 – May 31, 2000, the UNAVCO Boulder Facility performed the following GPS station upgrades in support of NAG5-8627:

- a. AREQ Arequipa, Peru. Upgraded station with new receiver for JPL Scintillation Project, new computer and an automated ISP dial-up communication scheme.
- b. MCM4 McMurdo, Ross Island. Relocated entire NASA/JPL IGS GPS equipment, and added new computer to current setup. There are currently three dual-frequency receivers providing data to JPL.
- c. QUIN Quincy, CA. Replaced faulty equipment, restored operations.
- d. SEY1 Mahe, Seychelles. Reconfigured ISP dial-up procedure (static IP), and relocated receiver to improve download stability.
- e. POSW/POPN Popocatepetl Volcano, Mexico. Maintenance work on existing dual-frequency station in conjunction with L1 network installation.
- f. Taal Volcano Philippines. Performed maintenance upgrades to the dual-frequency sites in the Taal GPS network.

## **3. Upcoming upgrades (with site visits).**

For FY 2001 the UNAVCO Boulder Facility will perform the following GPS station upgrades and installations on behalf of NASA:

- a. THU1 Thule, Greenland. Replace broken antenna/receiver, recon new monument site.
- b. KELY Kangerlussuaq, Greenland. Upgrade station equipment (rx, antenna, computer).
- c. EISL Easter Island. VSAT/IRIS installation on Easter Island, Chile (1s RTNT).
- d. MSKU Franceville, Gabon. Installation of an Ashtech Z12 receiver in collaboration with NASA/UNAVCO/IRIS at the VSAT/IRIS installation in Franceville, Gabon. This station will also satisfy the network requirements for NASA's Internet-based Global Differential GPS IDGD network.
- e. MBAR Mbarara, Uganda. Installation of an Ashtech Z12 receiver and a UNAVCO-developed PC104 computer in collaboration with NASA/UNAVCO/IRIS at the VSAT/IRIS installation in Mbarara, Uganda. This station will also satisfy the network requirements for NASA's Internet-based Global Differential GPS IDGD network.
- f. CHPI Sao Paulo, Brazil. Installation of a NASA TurboRogue receiver at a new GGN installation Sao Paulo, Brazil.
- g. IFRN Ifrane, Morocco. Provide site reconnaissance and a permanent station installation at Ifrane, Morocco, in support of the NASA's SENH program.

- h. UDMC Damascus, Syria. Provide site reconnaissance and a permanent station installation (Z-XII w/ EGADS) in Damascus, Syria, in support of the NASA's SENH program.
- i. GUAX Guadalupe Island, Mexico. Installation of a permanent GPS station with VSAT communications on Guadalupe Island, Mexico.

#### **4. Data management and archive efforts during the performance period.**

During the performance period July 1, 1999 – May 31, 2000, the UNAVCO Boulder Facility performed the following Data Management and Archiving functions. The Data Management and Archive Group managed the flow of data from up to 75 continuously operating GPS stations around the world. DMAG NASA support included development and testing of backup downloading and data distribution to CDDIS and JPL of 37 of NASA's Global GPS Network (GGN) and 38 SENH project stations. SENH projects included single-frequency L1 networks at Popocatepetl (with U. of Miami and UNAM), Hawaii (with USGS), Taal, Philippines (with U. of Indiana), DIVE (tide gauge monitoring with C. Wash. U.), and the Hayward Fault Zone (with U.C. Berkeley) as well as dual-frequency site in the eastern Mediterranean, Mexico and Central Asia. DMAG uses and maintains a variation of JPL's GNRT data management software. A key element of software development, maintenance and support is for UNAVCO's Translation, Editing and Quality Checking (TEQC) software used at hundreds of institutions around the globe. In addition to permanent station support, DMAG worked on recovering and pre-processing SENH and DOSE campaign data in preparation for archiving at CDDIS.

Please direct any questions regarding this report to Dr. Michael Jackson at UNAVCO (303-497-8008).

Very truly yours,



*for*

Wayne S. Shiver  
Facility Manager

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